Department of Energy
Ohio Field Office
Fernald Area Office
P. O. Box 538705
Cincinnati, Ohio 45253-8705
(513) 648-3155

4096

28 JAN 2002

Mr. James A. Saric, Remedial Project Manager
United States Environmental Protection Agency
Region V, SRF-5J
77 West Jackson Boulevard
Chicago, IL 60604-3590

DOE-0259-02

Mr. Tom Schneider, Project Manager
Ohio Environmental Protection Agency
401 East 5th Street
Dayton, OH 45402-2911

Dear Mr. Saric and Mr. Schneider:

TRANSMITTAL OF RESPONSES TO THE OHIO ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON THE AREA 3A/4A EXCAVATION/ON-SITE DISPOSAL FACILITY PHASE IV SUPPORT PLANS, CONSTRUCTION DRAWINGS AND TECHNICAL SPECIFICATIONS

References:
1. Letter, T. Schneider to J. Reising, "Comments – 3A/4A Excavation/ OSDF Phase IV Construction Documents," dated November 29, 2001
2. Letter, J. Saric to J. Reising, "OSDF Phase IV Construction Documentation," dated December 11, 2001

Enclosed for your approval are responses to the Ohio Environmental Protection Agency comments for the following Area 3A/4A Excavation/On-Site Disposal Facility (OSDF) Phase IV construction documents. Approval was received from the United States Environmental Protection Agency as noted in Reference 2.

- OSDF Phase IV Construction Drawings, Revision 0
- Area 3A/4A Excavation Construction Drawings, Revision 0
- OSDF Phase IV Technical Specifications, Revision 0
- Area 3A/4A Excavation Technical Specifications, Revision 0
- OSDF Phase IV Final Support Plans
- OSDF Phase IV Revised Final Calculation Package, Revision 0, Volume VI of VI

000001

If you have any questions or need further information, please contact Jay Jalovec at (513) 648-3122.

Sincerely,

Johnny Reising

FEMP:Jalovec

Johnny W. Reising
Fernald Remedial Action
Project Manager

Enclosures: As Stated

cc w/ enclosures:
J. Jalovec, OH/FEMP
R. Janke, OH/FEMP
T. Schneider, OEPA-Dayton (three copies of enclosures)
F. Hodge, Tetra Tech
AR Coordinator, Fluor Fernald, Inc./MS78

cc w/o enclosures:
D. Pfister, OH/FEMP
J. Reising, OH/FEMP
A. Tanner, OH/FEMP
D. Carr, Fluor Fernald, Inc./MS2
J. Chiou, Fluor Fernald, Inc./MS64
F. Flack, Fluor Fernald, Inc./MS64
T. Hagen, Fluor Fernald, Inc./MS65-2
U. Kumthekar, Fluor Fernald, Inc./MS64
D. Russell, Fluor Fernald, Inc./MS64
A. Snider, Fluor Fernald, Inc./MS64
C. Van Arsdale, Fluor Fernald, Inc./MS64
T. Walsh, Fluor Fernald, Inc./MS64
S. Wolinsky, Fluor Fernald, Inc./MS64
W. Zebick, Fluor Fernald, Inc./MS64
ECDC, Fluor Fernald, Inc./MS52-7

RESPONSES TO OHIO ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON THE AREA 3A/4A EXCAVATION/ON-SITE DISPOSAL FACILITY PHASE IV CONSTRUCTION DRAWINGS (20100/20104/20800)

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

SPECIFIC COMMENTS

AREA 3A/4A EXCAVATION CONSTRUCTION DRAWINGS (20800, REVISION 0)

Commenting Organization: Ohio EPA
Commentator: OFFO
Drawing #: 99X-5500-G-00517
Code: C
Original Comment #: 1

Comment: Ohio EPA finds the "Excavation Hierarchy Within Each Lift" drawing to be confusing and unnecessary (such as how C will be excavated before B). Either clarify the drawing or remove the drawing and leave the text description. Also, revise the chart showing the "Destination" of materials to be consistent with the "Request for Concurrence to Initiate Soil Stockpiles" approved by the Ohio EPA on November 17, 2001.

Response: Agreed. Confusion may stem from the numeric excavation hierarchy within each lift and the apparent alphabetic excavation sequence based on material type designations. However, it should be noted that the referenced detail drawing, excavation hierarchy, and associated table accurately illustrate the excavation hierarchy for each individual excavation lift. The three components of the detail may be simplified by swapping the "B" and "C" material type designations, illustrating the excavation of materials "A" and "C" in lift 1, followed by excavation of material "B" in lift 2, thus eliminating the apparent alphabetic sequence. The revised table will also specify stockpiles approved by the OEPA in the referenced request letter, noting that revision to these material destinations requires agency approval. Future packages may be better served to provide plan, section and sequence details specific to known above-waste acceptance criteria (WAC) and Resource Conservation and Recovery Act (RCRA) excavations rather than presenting a generic approach. A draft drawing illustrating this approach for Plant 9 above-WAC excavations is attached as Drawing 1.

Action: Drawing 99X-5500-G-00517 will be revised to clear up confusion and to be consistent with the referenced stockpile request letter. A draft revision of the drawing detail is attached for OEPA review. Specific above-WAC and RCRA area plan, section and sequence details will be considered for future packages versus a generic approach.

Commenting Organization: Ohio EPA
Commentator: OFFO
Drawing #: 99X-5500-G-00541
Code: C
Original Comment #: 2

Comment: The "Erosion Blanket Lined Ditch Detail" references the use of 'heavy duty UV stabilized nets'. Only biodegradable matting will be used. Please remove the reference to UV nets.

Response: Agreed.

Action: Drawing 99X-5500-G-00541 will be revised to remove the reference to UV nets. No change to technical specification Section 02205 is required.

AREA 3A/4A EXCAVATION TECHNICAL SPECIFICATIONS (20800-TS-0002, REVISION 0)

Commenting Organization: Ohio EPA — Commentator: OFFO
Section #: 02206 — Pg. #: 7 of 7 — Line #: 3.5 A — Code: C
Original Comment #: 3

Comment: This line states "When the design surface has been achieved, perform interim grading as follows." Absolutely NO grading is to be done in the excavations after design surface has been reached until certification sampling has been performed. Please correct.

Response: DOE agrees that interim grading should not take place until certification samples have been taken, except where safety dictates otherwise. Field conditions may arise where the stability of a design slope may preclude access to an area for sampling until the side slope can be stabilized. This may occur from a hydraulic blowout, unforeseen geotechnical conditions, or saturated soils at the base of a slope. The design was developed based on slope stability recommendations identified in the "Geotechnical Engineering Report of Project Order 177 A-E Support Services for Geotechnical Investigation of the Former Plant Area (20800-RP-0001)." The report recommends that temporary slopes exhibiting stress or failure be stabilized prior to personnel entering the excavations. If a particular side slope is evaluated as being unsafe after reaching the design surface, interim grading or excavation of overburden material may be required prior to access by sampling personnel. OEPA will be notified prior to such actions.

Action: Revise Section 02206, Item 3.5.A, to read:

"When the design surface has been achieved and certification samples have been taken, perform interim grading as follows:"

Add Section 02206, Item 3.5.B, to read:

"Where slope stability of the design surface cannot be verified in accordance with OSHA requirements to allow access to sampling equipment and personnel, repair or re-grade the slope as directed by the Construction Manager."

OSDF PHASE IV EXCAVATION CONSTRUCTION DRAWINGS (20104, REVISION 0)

Commenting Organization: Ohio EPA — Commentator: OFFO
Drawing #: 90X-6000-G-00330 — Code: C
Original Comment #: 4

Comment:

A. First, why is a new area being constructed instead of utilizing already existing areas? It would be much more in line with the sitewide goal of cleanup to reuse other areas then create a new one, which will need to be removed in the future. Which areas were considered as possible alternatives to new construction and why were they excluded? At a minimum, the area should be revised to avoid impact to wetlands in the proposed laydown area. Specifically the low lying area between the "goth tree" and the borrow area haul road.

B. Please show the proposed laydown area on a map, which portrays the current topography of the area, i.e. a map detailing the current physical details of the old STP. Additionally, show how equipment would enter and exit the area.

C. Justify the size of the laydown area being proposed.

D. Provide details on the stormwater/runoff management of this area and how it will be managed in light of the current level in the former STP excavation.

Response:

A. The hatched area shown on Drawing G-2 as construction laydown area, south of the rerouted north entrance road, was intended to show potential areas available to set up a construction laydown area. A new construction laydown area is necessary to the south of the cells for receiving and stockpiling construction materials for liners and cap construction for Cells 4 through 7 and for traffic control during construction of these cells. The existing construction laydown area west of Cell 2 is specifically for final cover construction of Cells 1 through 3. The trucks containing impacted material for placement in the cells to the south will not interfere with crossing traffic for final cover construction since the cap construction will always be north of impacted material placement. The existing construction laydown area is not suitable for construction of remaining Cell 4 through 7 liners because haul trucks would have to move the material around the cell to the north of the cells and use the remaining rerouted north entrance road and the new emergency access road to bring the material to the Cell 4 and 5 liner construction site. The emergency access road is not intended to be used by haul trucks. By placing a construction laydown area to the south of the cells, it eliminates haul trucks using the emergency access road and any cross traffic with trucks containing impacted material. Liner materials for both Cell 2 and Cell 3 had been located to the south of the actual liner construction. The current plan is to utilize the area south of Cell 7, shown on attached Sketch #1, for a construction laydown area. The construction laydown area consists of a 1-foot gravel base, which is graded to drain. This current plan will not impact the low lying area mentioned, but that low lying area will eventually be impacted by the construction of Cell 7 liner.

B. See attached Sketch #2, showing the existing topography, Sewage Treatment Plant (STP) excavation, Emergency Access Road, laydown area, and entry and exit from the laydown area.

C. Based on the current OSDF construction schedule, two liners, one liner and one cap, or two caps will be constructed in each calendar year, requiring double the size of laydown area for stockpiling of construction materials each year, compared to the existing size of the laydown area.

D. The storm water level in the STP excavation will be controlled by earthen spillways, which will allow runoff to flow into the pond and exit at the same elevation. The flow will continue into downstream ditches and to their respective reservoirs. See the attached Sketches #3 and #4.

Action: The delineation of the new Construction Laydown Area will be revised to show the new construction laydown area located south of Cell 7.

OSDF PHASE IV TECHNICAL SPECIFICATIONS (20104-TS-0001, REVISION 0)

Commenting Organization: Ohio EPA Commentator: ODH
Section #: 02930 Pg. #: Tables 02930-1A and 1B Code: C
Original Comment #: 5

Comment: The two tables contain lists of seed mixtures that are appropriate for permanent vegetation in wet and dry areas. Neither of these tables accurately reflect the seed composition approved for the Cell 1 Cap. The permanent vegetation appropriate for the OSDF is not appropriate for areas undergoing restoration. Another table should be created and titled "Seed mix for the OSDF Cap". The species mix should be the same as approved by Ohio EPA for the Cell 1 Cap.

Response: At the time the Phase IV Certified-for-Construction (CFC) package was being developed, the seed mix for the OSDF Final Cover System was still being revised. The Phase IV CFC package included all Design Change Notices (DCNs) for Phase III issued up through August 2001. The plans were issued in early September 2001. Many revisions to the seed mix occurred after that time frame.

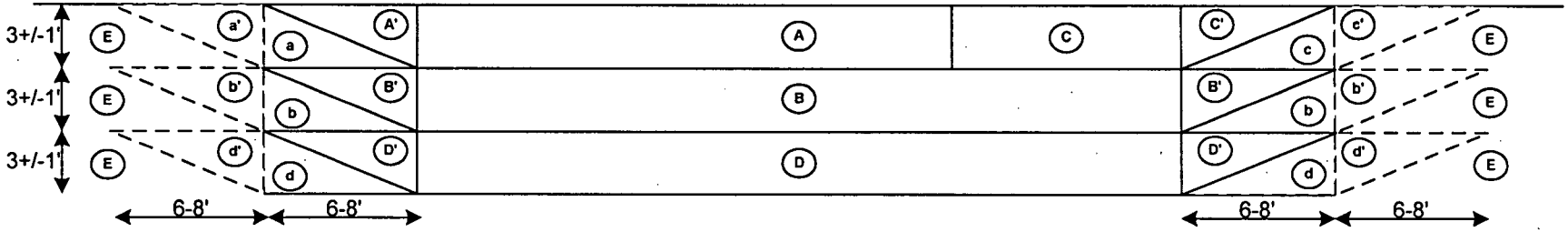
Action: A DCN will be written to incorporate all changes to the seed mix and particularly add the table which contains the "Seed Mix for Cell Final Cover Permanent Vegetation". A draft version of the revised tables are attached.

OSDF PHASE IV FINAL SUPPORT PLANS (20100-PL-0003, REVISION 1/20100-PL-0004, REVISION 1/20100-PL-0006, REVISION 1/20100-PL-0007, REVISION 3)

No comments.

OSDF PHASE IV REVISED FINAL CALCULATION PACKAGE (20100-CA-0001, REVISION 0)

No comments.



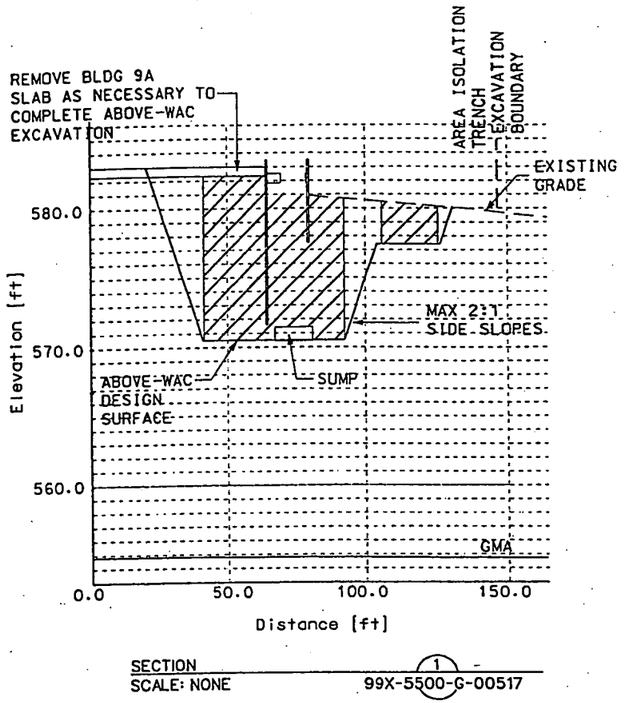
Excavation Hierarchy Within Each Lift

1. Excavate AWAC for both organic & radiological COCs (A)
2. Excavate AWAC/RCRA organic COCs (B)
3. Excavate AWAC radiological COCs (C)
4. Excavate BWAC organic COCs that may be RCRA (D)

LIFT	LETTER	MATERIAL DESCRIPTION	DESTINATION	REQUIREMENTS
1	A	AWAC for both radiological and organic COCs	AR6-003	None
	A'	Potential AWAC for both radiological and organic COCs	Interim Stockpile	-Use equipment not contaminated with AWAC soil -Create 2:1 side slopes
	a	Contingency – AWAC for both radiological and organic COCs	AR6-003	-Excavate as directed by the CM based on real-time scan and/or sample results of A'
	a'	Contingency – Potential AWAC for both radiological and organic COCs	Interim Stockpile	-Excavate as directed by the CM using equipment not contaminated with AWAC soil -Create 2:1 side slopes
	C	AWAC for radiological COCs	SP-7	None
	C'	Potential AWAC for radiological COCs	Interim Stockpile	-Use equipment not contaminated with AWAC soil -Create 2:1 side slopes
	c	Contingency – AWAC for radiological COCs	SP-7	-Excavate as directed by the CM based on real-time scan and/or sample results of B'
	c'	Contingency – Potential AWAC for radiological COCs	Interim Stockpile	-Excavate as directed by the CM using equipment not contaminated with AWAC soil -Create 2:1 side slopes
2	B	AWAC/RCRA for organic COCs	Soil Staging Area	None
	B'	Potential AWAC/RCRA for organic COCs	Soil Staging Area	-Use equipment not contaminated with AWAC soil -Create 2:1 side slopes
	b	Contingency – AWAC/RCRA for organic COCs	Soil Staging Area	-Excavate as directed by the CM based on real-time scan and/or sample results of C'
	b'	Contingency – Potential AWAC/RCRA for organic COCs	Soil Staging Area	-Excavate as directed by the CM using equipment not contaminated with AWAC soil -Create 2:1 side slopes
3	D	BWAC for organic COCs, but possibly RCRA	Interim Stockpile	None
	D'	Potential BWAC for organic COCs, and possibly RCRA	Interim Stockpile	-Use equipment not contaminated with AWAC soil -Create 2:1 side slopes
	d	Contingency – BWAC for organic COCs and possibly RCRA	Interim Stockpile	-Excavate as directed by the CM based on real-time scan results of D'
	d'	Contingency – Potential BWAC for organic COCs and possibly RCRA	Interim Stockpile	-Excavate as directed by the CM using equipment not contaminated with AWAC soil -Create 2:1 side slopes
ALL	E	BWAC for all COCs	OSDF	-As directed by the CM

Notes:
1. Excavate AWAC and RCRA materials in 3-ft +/- 1-ft lifts in accordance with technical specification 02205
2. If an excavation lift does not possess a material type listed in the excavation hierarchy, proceed with the next material type listed in the hierarchy.

Constituents of Concern Material Excavation Detail



SECTION 1 / SCALE: NONE — 99X-5500-G-00517

1. REMOVE AT-GRADE DEBRIS FROM ABOVE-WAC AREAS AND CLEAN OF VISIBLE SOIL/GRAVEL WITHIN THE EXCAVATION AREAS.

2. HAUL CLEAN DEBRIS TO THE OSDF. DISPOSE OF DEBRIS THAT IS NOT CLEANED WITH UNDERLYING SOIL.

3. EXCAVATE ABOVE-WAC AREAS IN 3-FT +/- 1-FOOT LIFTS TO THE COORDINATES AND ELEVATIONS SHOWN, LEAVING VERTICAL SIDEWALLS.

4. HAUL EXCAVATED ABOVE-WAC MATERIAL TO SP-7. DO NOT TRACK EQUIPMENT THROUGH THE ADJACENT ABOVE-WAC AREA.

5. UPON COMPLETION OF EACH ABOVE-WAC EXCAVATION LIFT:
   - A. DECONTAMINATE THE EXCAVATOR BUCKET WITHIN THE EXCAVATION AREA AS DIRECTED BY THE CONSTRUCTION MANAGER.
   - B. EXCAVATE ABOVE-WAC AREA SIDE SLOPES TO 2H:1V AND TEMPORARILY STOCKPILE MATERIAL ADJACENT TO THE EXCAVATION.
   - C. THE CONSTRUCTION MANAGER ARRANGES FOR REAL-TIME MONITORING OF ABOVE-WAC AREA SIDE SLOPES AND FOOTPRINT.
   - D. THE CONSTRUCTION MANAGER DIRECTS DISPOSAL OF STOCKPILED SIDE SLOPE MATERIAL, AS WELL AS, FURTHER ABOVE-WAC EXCAVATION AS NECESSARY.

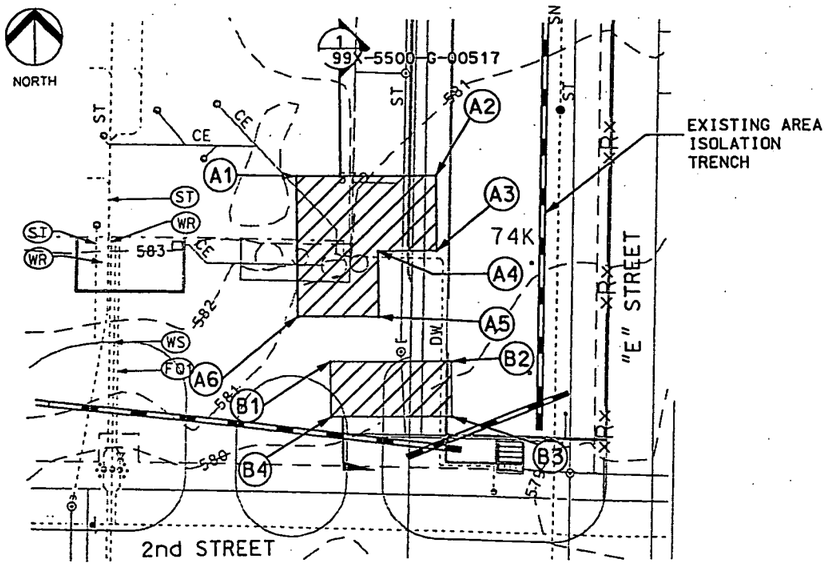
6. UPON REACHING THE DESIGN LIMITS OF THE ABOVE-WAC EXCAVATION:
   - A. DECONTAMINATE THE EXCAVATOR BUCKET WITHIN THE HAUL TRUCK BED AS DIRECTED BY THE CONSTRUCTION MANAGER.
   - B. DECONTAMINATE THE HAUL TRUCK BED IN SP-7.
   - C. EXCAVATE ABOVE-WAC AREA SIDE SLOPES TO 2H:1V AND TEMPORARILY STOCKPILE MATERIAL ADJACENT TO THE EXCAVATION.
   - D. THE CONSTRUCTION MANAGER ARRANGES FOR REAL-TIME MONITORING OF ABOVE-WAC AREA SIDE SLOPES AND FOOTPRINT.
   - E. THE CONSTRUCTION MANAGER DIRECTS DISPOSAL OF STOCKPILED SIDE SLOPE MATERIAL, AS WELL AS, FURTHER ABOVE-WAC EXCAVATION AS NECESSARY.

ABOVE-WAC AREA EXCAVATION SEQUENCE AND REQUIREMENTS — 99X-5500-G-00521

GENERAL NOTES

1. FOR LEGEND AND GENERAL NOTES, SEE DRAWING 99X-5500-X-00503.
2. INITIALLY EXCAVATE ABOVE-WAC AREAS AS SHOWN ON THIS DRAWING. CONSTRUCTION MANAGER WILL VERIFY THE LIMITS OF ABOVE-WAC MATERIAL IN THE FIELD. SUPPLEMENTAL EXCAVATION MAY BE DIRECTED BY THE CONSTRUCTION MANAGER.
3. LOAD TRUCKS IN BUFFER ZONE OUTSIDE OF ABOVE-WAC AREA IN ACCORDANCE WITH TECHNICAL SPECIFICATION SECTION 02205.
4. SURVEY LIMITS AND ELEVATION OF EACH EXCAVATED LIFT IN ABOVE-WAC EXCAVATION.
5. MAINTAIN POSITIVE DRAINAGE WITHIN ABOVE-WAC EXCAVATIONS TO COLLECT WATER. IF VOCS ARE PRESENT WATER WILL BE SAMPLED AND ANALYZED TO DETERMINE DISPOSITION.
6. MAXIMUM DEPTH OF EXCAVATION SHALL BE 6'. FOR DEEPER EXCAVATIONS, CONTRACTOR TO PROVIDE BENCHES TO FACILITATE SAFE SLOPES.
7. SURVEY FINAL EXCAVATION LIMITS. FLUOR FERNALD TO CONDUCT CONFIRMATION MONITORING AT BOTTOM OF ABOVE-WAC MATERIAL EXCAVATION IN ACCORDANCE WITH SECIFICATION SECTION 02205.
8. EXCAVATION OF ABOVE-WAC AREAS SHALL BE IN ACCORDANCE WITH SPECIFICATION 02205.

DRAWING 1



ABOVE-WAC EXCAVATION PLAN
SCALE: 1"=20' (PLAN VIEW)

ABOVE-WAC EXCAVATION COORDINATES

AREA	DESCRIPTION	DISPOSAL DESTINATION	COORD.	NORTHING	EASTING
A	ABOVE-WAC URANIUM AND TC-99	SP-7	A1	480891.15	1350189.19
			A2	480891.15	1350238.89
			A3	480863.84	1350238.89
			A4	480863.84	1350218.20
			A5	480840.09	1350218.20
			A6	480840.09	1350189.19
B	ABOVE-WAC URANIUM AND TC-99	SP-7	B1	480823.58	1350200.74
			B2	480823.58	1350243.80
			B3	480803.56	1350243.80
			B4	480803.56	1350200.74

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REV. NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	DATE	REV. BY INITIALS AND DATE	APPR.
0	ISSUED CERTIFIED FOR CONSTRUCTION	8/20/01		GEP
B	ISSUED FOR INTERNAL REVIEW	8/15/01		
A	ISSUED FOR BID PURPOSES	8/3/01		

UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

THIS DRAWING PREPARED BY
FLUOR FERNALD, INC.

PROJECT NAME
SDFP REMEDIATION OF AREAS 3A/4A - PKG.

DRAWING TITLE
ABOVE-WAC AREA EXCAVATION DETAILS

APPROVALS

COGNIZANT ENG.	C.C. VAN ARSDALE	8/20/01	SAFETY ENG.	D. GRANT	8/20/01
CIVIL & STR.			MAINTENANCE		
ELECTRICAL			FIRE PROTECT.		
ENGINEER	D. RUSSELL	8/20/01	WASTE MANAGE.		
INSTRUMENT			SECURITY		
MECHANICAL			QA	M. GOOBER	8/20/01
			CONSTRUCTION	B. ZEBICK	8/20/01
CHECKED	C. NEUMANN	8/20/01			
APPROVED	G.E. PAUL	8/20/01			

DRAWN BY	PROJECT NO.	DRAWING INDEX CODE NO.	SHEET NO.	REV. NO.
RES PROJECT NO. 4271	20800 FILENAME 99XG0517.DGN	99X-5500-G-00517	17	0

HAIN-LINK FENCE

OTE 17)

N

EXISTING 24' WIDE GATE TO BE REMOVED

EXISTING RUN-OFF DIVERSION CHANNEL

EXISTING POWER POLE OP77
N 479,243.40
E 1,351,442.23

E 1,351,665.56

EXISTING POWER POLE OP83
N 479,200.35
E 1,351,471.06

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OSDF-2

W-2428

OSDF-3

STP EXCAVATION AREAS

EXISTING EMERGENCY ACCESS ROAD (NOTE 15)

EXISTING CONTRACTOR ADMINISTRATION AREA

BORROW ROAD C

EXISTING 24' WIDE GATE

CONSTRUCTION LAYDOWN AREA

EXISTING BORROW AREA HAUL ROAD CORRIDOR

BORROW AREA SUBARE 5

EXISTING RESTORED AREA

SOUTH STOCKPILE AREA

6

7

14
G-18

OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP AT CELL 7 (NOTE 12)

DOE-WMCO-1A

RELOCATED ACCESS CONTROL FACILITY (BY OTHERS)

VH-6

VH-7

EXISTING CVH

ILTS

BUILDING 77

EXISTING ACCESS CONTROL FACILITY TO BE RELOCATED (BY OTHERS)

BORROW AREA SEDIMENTATION BASIN

NG OSDF MATERIAL
SFER AREA (OMTA)

2nd STREET IMPACTED MATERIAL HAUL ROAD (NOTE 18)

WHEEL WASH

PERMANENT LIFT STATION AND FORCEMAIN TO BIO-DENITRIFICATION SURGE LAGOON (BSL)

EXISTING OSDF SEDIMENTATION BASIN NO. 2

EXISTING GUARD SHACK

SKETCH #1

SCALE: 1" = 200'

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RUN-OFF DIVERSION CHANNEL MODIFICATION AT EXISTING BORROW AREA HAUL ROAD (73 / G-39)

STP EXCAVATION

EXISTING CONCRETE BARRIER (TYP)

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EXISTING CHAIN-LINK FENCE

RUN-OFF DIVERSION CHANNEL TO EXISTING BORROW AREA SEDIMENTATION BASIN (84 / G-41)

BORROW AREA ROAD

CONSTRUCTION LAYDOWN AREA

EXISTING BORROW AREA HAUL ROAD CORRIDOR

FLOW

HAUL TRUCKS TO CONSTRUCTION

CULVERT

DELIVERIES

24' WIDE GATE (NOTE 11)

EMERGENCY ACCESS ROAD

EMERGENCY ACCESS ROAD

SKETCH #2

SCALE: 1"=50'

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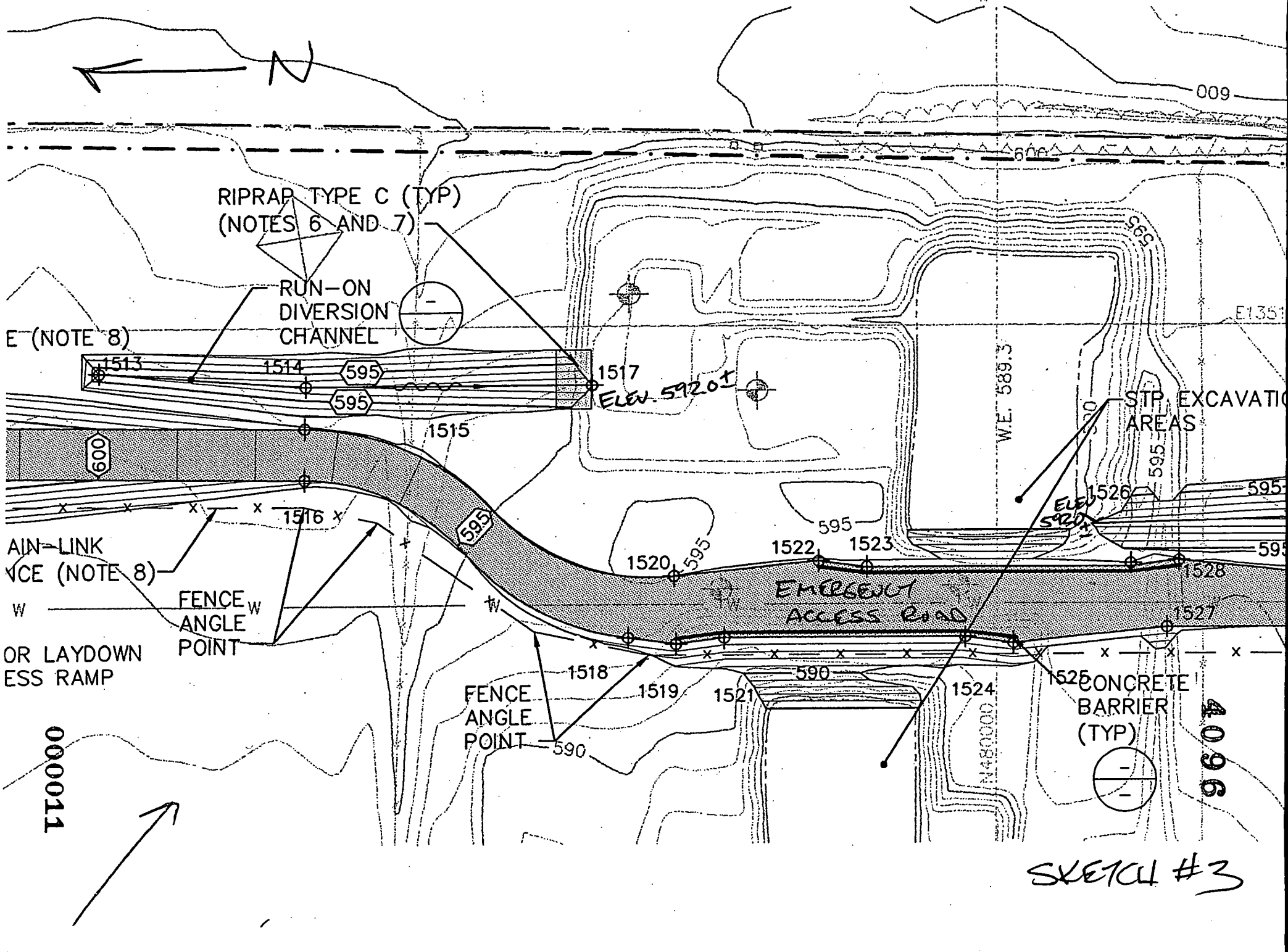
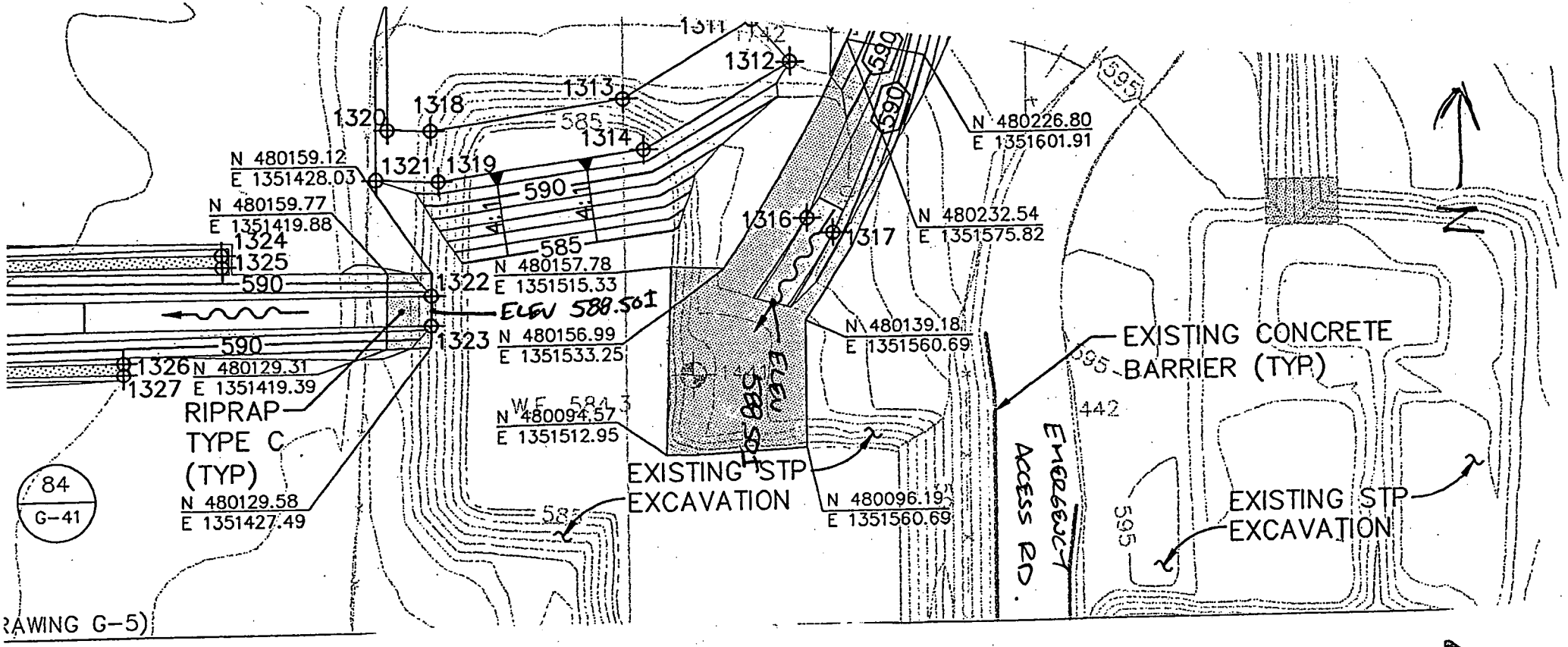

N
RIPRAP TYPE C (TYP)
(NOTES 6 AND 7)
RUN-ON
DIVERSION
CHANNEL
E (NOTE 8)
1513
1514
595
595
1517
ELEV. 592.0±
1515
600
595
1516
AIN-LINK
NCE (NOTE 8)
FENCE
ANGLE
POINT
OR LAYDOWN
ESS RAMP
1520
595
1522
1523
EMERGENCY
ACCESS ROAD
1528
1527
1518
1519
1521
590
1524
1525
FENCE
ANGLE
POINT
590
CONCRETE
BARRIER
(TYP)
W.E. 589.3
595
595
1526
ELEV.
592.0±
STP EXCAVATI
AREAS
009
595
595
595
590
N480000
000011
4096
SKETCH #3



SCALE 1"=50'

SKETCH #4

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TABLE 02930-1A

SEED MIX IN DRY AREAS FOR PERMANENT VEGETATION

SPECIES	POUNDS PER ACRE (lb/ac)
Big Bluestem (*Andropogen gerardi*)	3
Little Bluestem (*Andropogen scoparius*)	2
Side-Oats Grama (*Bouteloua curtipendula*)	0.5
Indian Grass (*Sorghastrum nutans*)	2
Canada Wild-Rye (*Elymus canadensis*)	25
Switch grass (*Panicum virgatum*)	0.5
ReGreen	5
Wildflowers[(1)]:	1.5
Butterflyweed (*Asclepias tuberosa*)	
New England Aster (*Aster novae-angliae*)	
Smooth Aster (*Aster laevis*)	
Canada Milkvetch (*Astragalus Canadensis*)	
Purple Prairie Clover (*Petalostemum purpureum*)	
Ox-eye Sunflower (*Heliopsis helianthoides*)	
Bergamot (*Monadara fistulosa*)	
Purple Coneflower (*Echinacea purpurea*)	
Pale Purple Coneflower (*Echinacea pallida*)	
Yellow Coneflower (*Ratibida pinnata*)	
Black-Eyed Susan (*Rudbeckia hirta*)	
Spiderwort (*Tradescantia ohioensis*)	
Blue Vervain (*Verbena hastata*)	
Hoary Vervain (*Verbena stricta*)	
Beardtongue (*Penstemon grandiflorus*)	
Cupplant (*Silphium perfoliatum*)	
Sweet Joe Pye-Weed (*Eupatorium purpureum*)	
White False Indigo (*Baptisia leucantha*)	
Blue False Indigo (*Baptisia australis*)	
Partridge Pea (*Cassia fasciculata*)	
Rattlesnake Master (*Eryngium yuccifolium*)	
Round-headed Bush Clover (*Lespedea Capitata*)	
Stiff Goldenrod (*Solidago risida*)	

Note: [(1)]–Wildflower mix to be apportioned according to species aggressiveness and seed counts as approved by the Construction Manager. If certain species are not available, appropriate substitutions will be approved by the Construction Manager.

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TABLE 02930-1B

SEED MIX IN WET AREAS[1] FOR PERMANENT VEGETATION

Species	POUNDS PER ACRE (lb/ac)
Big Bluestem *(Andropogen gerardi)*	3
Canada Wild-Rye *(Elymus canadensis)*	25
S Grass *(Panicum virgatum)*	0.5
Blue Joint Grass *(Calamagrostis canadensis)*	0.5
Porcupine Sedge (*Carex hystericina*)	1 ounce per acre (oz/ac)
Fox Sedge (*Carex stipata*)	1 ounce per acre (oz/ac)
Dark Green Bulrush (*Scirpu.s atrovirens*)	1 ounce per acre (oz/ac)
ReGreen	5
Prairie Cordgrass (*Spartina pectinata*)	1
Wildflowers[2]:	1.5
Red Milkweed (*Asclepias incarnata*)	
New England Aster (*Aster novae-angliae*)	
Wild Senna (*Cassia hebecarpa*)	
Canada Tick Trefoil (*Desmodium canadense*)	
Prairie Blazingstar (*Liatris pycnostachya*)	
Great Blue Lobelia (*Lobelia siphilitica)*	
Bergamot (*Monadara fistulosa*)	
Yellow Coneflower (*Ratibida pinnata*)	
Branched Coneflower (*Rudbeckia hirta*)	
Blue Vervain (*Verbena hastata*)	
Angelica (*Angelica atropurpurea*)	
Sweet Joe-Rye Weed (*Eupatorium purpureum)*	

Notes: (1) Seeding in drainage ditches or swales shall contain erosion mats as specified in Section 02270 after application of seed mixture. Erosion mat shall cover a minimum width of 12 feet.

(2) Wildflower mix to be apportioned according to species aggressiveness and seed counts as approved by the Construction Manager. If certain species are not available, appropriate substitutions will be approved by the Construction Manager.

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TABLE 02930-1C

SEED MIX FOR CELL FINAL COVER PERMANENT VEGETATION

Species Grass	POUNDS PER ACRE (lb/ac)
Big Bluestem *(Andropogen geradi)*	0.5
Little Bluestem *(Andropogen scoparius)*	3
Side-Oats Grama *(Bouteloua curtipendula)*	5
Buffalo Grass *(Buchloe dactyloides)*	1
Indian Grass *(Sorghastrum nutans)*	0.5
Canada Wild-Rye *(Elymus Canadensis)*	25
Annual Rye *(Lolium multiflorum)*	10
Prarie Dropseed *(Sporobulus heterolepis)*	1.5
Species **Wildflower**	**Ounces Per Acre** **(oz/ac)**
Butterflyweed *(Asclepias tuberosa)*	3.125
Smooth Aster *(Aster laevis)*	0.25
Ox-eye Sunflower *(Heliopsis helianthoides)*	1.75
Bergamot *(Monadara fistulosa)*	0.25
Purple Coneflower *(Echinacea purpurea)*	2.0
Pale Purple Coneflower *(Enhinacea pallida)*	2.0
Yellow Coneflower *(Ratibida pinnata)*	0.375
Black-Eyed Susan *(Rudbeckia hirta)*	1.0
Spiderwort *(Tradescantia ohioensis)*	1.25
Hoary Vervain *(Verbena stricta)*	0.50
Beardtongue *(Penstemon grandiflorus)*	1.0
Sweet Joe Pye-Weed *(Eupatorium perpureum)*	0.25
White False Indigo *(Baptisia leucantha)*	4.25
Blue False Indigo *(Baptisia australis)*	4.25
Partridge Pea *(Cassia fasciculate)*	32
Round-headed Bush Clover *(Lespedea Capitata)*	1.0
Stiff Goldenrod *(Solidago risida)*	0.75

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TABLE 02930-2

SEED MIX FOR INTERIM VEGETATION

Species	Pounds Per Acre (lb/ac)
ReGreen	50
Partidge Pea (*Cassia fasciculate)*	10
Canada Wild Rye (*Elymus Canadensis*)	40

[END OF SECTION]